Combined MAFAC Commerce Sub-Committee Comments on the draft National Aquaculture Research and Development Strategic Plan

The report should be lauded and is a bold and comprehensive research and development plan that does a fine job of both identifying the chief impediments to and the steps needed to improve and expand aquaculture production in the U.S. Many of the research objectives are necessary to move the business of aquaculture forward in a competitive global industry and address lingering concerns, especially environmental.

However, MAFAC has some general and specific comments on the draft National Aquaculture Research and Development Strategic Plan that, if rectified, will greatly strengthen the Plan and support domestic aquaculture production.

Overarching Comments or Issues

- The document also refers to interagency collaboration to eliminate overlap, find synergies and maximize benefits; however, little specific detail is provided to describe which redundancies might be eliminated or where cost saving synergies might be found.

- Many goals and outcomes will require significant investments and leadership by government entities. The plan should include projections on the estimated cost of some of these objectives, and the potential economic impact of some of the desired outcomes. It is clearly in the Nation's best interest to reduce the trade deficit, create jobs, and increase food security domestically. Half of the world's seafood is cultured, and the U.S. seafood deficit is about $10 billion. Without considerable public sector support for aquaculture development the U.S. will not be able to reduce this deficit. A significant Aquaculture budget request will be required to reap any of these benefits. Federal support of a long term, significant R&D program could make an impact to domestic production to make U.S. marine aquaculture globally competitive. However, if resources are not adequate, the research will result in published presentations or papers, but not put into practice.

  If the United States supports an aquaculture development policy that encourages the United States to be a production leader, which is *not* the current status quo, then a 5-10 year budget equal to the task must also be envisioned and would be an appropriate component for a 5-10 year R&D strategic plan.

- The Draft Plan appears to presume that aquaculture development is limited by some unsolved mysteries that must be overcome for the industry to advance. However, if we consider all aquaculture (catfish, trout, etc.) then many industries are already big and are limited by some factor unrelated to technological advances.

- The primary obstacles to marine aquaculture development and expansion in the US are availability of space, citing conflicts, regulatory challenges, NIMBYs, and lack of an offshore framework. Technological limitations don't hinder U.S. advances in shellfish, macro algae, or finfish as much as the lack of a regulatory mandate to move forward and permit space use here, no matter what technology is developed. Thus, it appears the cart is in front of the horse – if there were space and a reasonable permitting mechanism, we would develop an industry; this

industry might or might not experience problems which would then need research to develop solutions. This Draft Plan appears to develop a justification for a research budget that will likely ***not*** result in an expanded industry

- Until the permitting issue is resolved, most of the techniques or technologies that we develop through research to improve production will be implemented in other countries and not in the U.S. Until we address these impediments the return on our investment in aquaculture research will be reaped overseas, and we will continue to import more aquaculture product. If we don't establish a legal regulatory framework for permitting in the EEZ we can ensure these waters will never be developed. It is important to focus within one or more of the stated goals the objective of developing a concise, streamlined permitting framework that encourages businesses to invest in the development of domestic aquaculture in Federal waters (this was a key statement of the developed policies that MAFAC supported in 2010). In other countries, industry is encouraged and provided incentives to develop aquaculture businesses, but that is lacking in the U.S.

- There are still many unknowns and a great degree of hyperbole about the environmental impacts of aquaculture. These unknowns may never be resolved unless we try some new farms and monitor the impacts. Unless there is a legitimate risk of irreversible harm (such as introduction of non-natives, permanent habitat destruction, release of fertile GMO animals) then some degree of risk is justifiable in order to answer some of these compelling questions. The precautionary principle applies to irreversible harm.

- Improvement in "environmental performance" (page 9) has also been a result of scientific research to resolve unknowns and dispel various myths purporting ecological damage by aquaculture. Much of this work has been achieved through government-funded research and it is critical that this work continues to help address any new environmental impact concerns. However, impacts of aquaculture should be compared with other food production and land and water-use practices for proper perspective.

Summary and Specific Comments by Goal or Page:

- **The Vision Statement:** Delete the last sentence in the Vision statement; there is not clear benefit for its inclusion.

- **Page 3:** First bullet states in part "…Federal R&D commitment that encourages the development of aquaculture in the Nation" and the last bullet states "…support the responsible and sustainable expansion and operation of aquaculture nationally." Clearly, the vision is that aquaculture must be developed in the U.S. However, the Strategic Plan lacks incentives for companies to place their capital at risk or assurances that an operation will be given a chance to fail (or hopefully succeed). The current framework is fraught with uncertainty, and from a global perspective, creates a disincentive to establish operations in the United States. The framework must be incorporated more clearly into this Strategic Plan. It has been discussed at length and at all levels, such that a permit framework should be able to be explicitly described to encourage the expansion of aquaculture in federal waters. If we cannot create a document that does this then we are ignoring our own policies.

- **Page 8:** Similar to what is noted in the preceding bullet, the third paragraph on page 8 opens "Regulations have been cited as barriers to aquaculture development in the U.S. for 30 years. " It further notes that we can develop policies and regulations that both protect our natural resources and provide the Nation with an opportunity to be a world leader in aquaculture. This framework should then be articulated or developed with stakeholders either before or coincidently with the R&D Strategic Plan and potentially be its own Goal.

- **Goal 2** – Genetic improvement will yield huge improvements in production, however this work is very expensive and will require substantial government funding. Without a breeding program for cultured species it will be near impossible for the United States to compete with other countries in the long run or to develop products that are more affordable to the consumer. Integrity of wild populations can be conserved while we enhance the cultured population with traits such as faster growth, disease resistance, better yields that address the needs of a growing world that needs healthy protein. These programs are historically developed with USDA and can be long term programs that must be funded for 10-15 years to see measurable and lasting results. However, some efforts are likely to bring tremendous improvements in production economies in a relatively short timeframe (such as for those species where domestication efforts are in their infancy). Development of genetic risk models will help quantify the risk of genetic interactions between wild and domesticated stocks.

- **Goal 4** – Improve production efficiency. Hatchery production for marine finfish species is very limited and is a limiting factor in the development of aquaculture in Federal waters and in land based systems. Developing broodstock for year round production of a variety of species is a long term investment that should also be linked to a breeding program. This sector is ideal for a private-public partnership as it has broad benefits downstream as an enabling technology.

- **Goal 5** – Nutrition: Since shellfish do not require formulated feeds or fishmeal, the report should eliminate reference to shellfish in this section. Novel sources of high-PUFA feed ingredients should be identified and evaluated as potential feed ingredients. For instance seaweed harvested for nutrient-bioextraction and eutrophication mitigation or fisheries by-catch products could both be viable sources of high-PUFA meal ingredients.

- **Goal 5** - Novel Feed Development: This goal has been a priority for a number of years and is of critical importance, especially in a developing species; however feed companies are already investing in and doing much of this as a result of consumer, regulatory, and industry pressures. As there is no industry (finfish) without feed, this feedback loop is always present to push research forward. The proposed research can help 'fast-track' development but one should be cautioned that the novel feeds developed at a research institution must have an economic benefit to the producer that can be realized in the life cycle of a production. There should be linkages with feed industry representatives or associations to assure the research is both practical as well as novel, otherwise who will produce the developed feeds for industry?

- **Goal 6** – Nutritious safe seafood: Naturally occurring pathogens such as Vibrio bacteria and toxic algal blooms create significant challenges for producers, especially for shellfish. Research can help industry develop better tools for predicting, measuring, and eliminating these species.

- **Goal 7** – Culture of marine species are no longer limited to the geographical area within which they are found in nature. Land-based marine production systems that are 100% closed are being operated commercially and much research is underway in this field. Antifouling cage materials that are environmentally benign are available and could save significant site operating costs. Such developments are critical to pushing the industry forward. This goal will be instrumental dramatically increasing seafood/sea-vegetable production. Carbon footprints can be dramatically reduced through U.S. production, compared to product being shipped from distant ports.

- **Goal 8**: Will the JSA be responsible for the "pooling" and administration of the various agencies' research budgets to support these actions to reduce redundancy and reinventing the wheel, similar to their role as the coordinating agent for implementation actions in the Plan?

- **Goal 9**

    - Economic and social sciences: Solid pricing, low interest loans for capital investment, good crop insurance and regulatory relief will ensure that the industry will grow and thrive. Rapid expansion of aquacultural production without commensurate investments in marketing will lead to price collapse and painful industry consolidation, as has happened in the past. If production growth is a goal, then producers need marketing assistance until the industry matures. Local and coastal markets can only absorb a limited volume of product before prices are negatively impacted. However, small producers are ill equipped to conduct a proper national marketing campaign. Additionally, market research would help producers maximize the benefits of their marketing investments, yet market research appears to have been overlooked in this report.

    - There are ways in which social science research can help breakdown some of the permit citing and leasing barriers that are impeding the development of marine aquaculture. Socio-economic studies can help user groups map the areas that they utilize to identify low-conflict areas. Software mapping tools are available that allow different user groups to identify the most important areas they wish to protect. Additionally, resource managers need tools to evaluate the claims of conflicts by competing user groups. When fishermen claim that a site is critical for their fishery, or when recreational users say a site is heavily used, managers have no way of evaluating the veracity of these claims. Vessel tracking, satellite imagery or shoreside radar tracking and modeling could help resolve these questions.

    - New socio-economic analyses can help determine the "highest and best use" of a public waterway using criteria such as least environmental impact and maximum socio-economic benefit and can help guide resource managers and stakeholders while they prioritize the use of limited public resources.

    - One issue is how to make the regulatory processes less complicated and certain. If a risk cannot be quantified, businesses will likely not invest due to uncertainty. This relates to the first identified outcome "Identify and **resolve** key regulatory, policy and socioeconomic and environmental constraints to improve the economics of commercial

aquaculture and public stock enhancement and restoration in the United States." However, a desired parallel outcome could be: Identify and **resolve** key regulatory, policy and socioeconomic and environmental constraints to improve the **permit process to encourage aquaculture in Federal waters in keeping with the Federal Aquaculture Policies of 2010**.